

We claim:

1.

A method of extracting metal ions from an aqueous solution comprising contacting the aqueous solution with a material comprising antimony silicate doped with one or more elements selected from the group consisting of tungsten, niobium and tantalum.

2.

A method according to claim 1 wherein the material has a Si:Sb ratio of less than 5.

3.

A method according to claim 1 wherein the one or more elements is present in the material at a concentration in the range from about 0.5 to about 30.0 weight %.

4.

A method according to claim 2 wherein the one or more elements is present in the material at a concentration in the range from about 0.5 to about 30.0 weight %.

5.

A method according to claim 1 wherein the material has a crystalline structure as shown by an X-ray diffraction analysis of the material.

6.

A method according to claim 1 wherein an X-ray diffraction pattern of the material shows a crystalline antimony silicate structure.

7.

A method according to claim 1 in which the aqueous solution has a pH <7.

8.

A method of extracting metal ions from an aqueous solution of $\text{pH} < 7$ comprising contacting an aqueous solution of $\text{pH} < 7$ with a material comprising antimony silicate doped with one or more elements selected from the group consisting of tungsten, niobium and tantalum.

9.

A method according to claim 1 in which the metal ions are radioactive metal ions.

10.

A method according to claim 9 in which the radioactive metal ions comprise Sr, Cs, Co, Pu or Am ions.

11.

A method according to claim 9 in which the radioactive metal ions comprise Zn, Fe or Mn ions.

12.

A method according to claim 9 in which the aqueous solution is acidic and contains background ions, such as Na, K, Mg, and Ca ions, at a higher concentration than the concentration of the radioactive metal ions.

13.

A method according to claim 9 in which the aqueous solution is acidic and contains background ions, such as Na, K, Mg and Ca ions, and in which the radioactive metal ions are selectively removed from the aqueous solution, the background ions being left behind in the aqueous solution.

14.

A method of extracting radioactive metal ions from an aqueous solution of $\text{pH} < 7$ comprising contacting an aqueous solution of $\text{pH} < 7$ with a material comprising antimony silicate doped with one or more elements selected from the group consisting of tungsten, niobium and tantalum.

15.

A method according to claim 14 in which the radioactive metal ions comprise Sr, Cs, Co, Pu or Am ions.

16.

A method according to claim 14 in which the radioactive metal ions comprise Zn, Fe or Mn ions.